

Group 2 Disclaimer

- Group led by two “optical types”: results may be biased
- Modelers significantly underrepresented
- Not enough time to discuss the full range of issues charged to group
 - Did not discuss in science priority order
 - No science “weight” should be applied to the topics we covered over those we missed.

Direct Aerosol Forcing

- How does particle morphology influence particle scattering & absorption?
- Coated particles
 - How does coating affect optical properties and wavelength dependence of those properties
 - How does coating affect surface reactivity of coated particles?
- Hygroscopicity:
 - How does humidification of aerosols affect light absorption and scattering?
 - Require better modeling of the hygroscopic growth of particles.
- Quantification of the biomass contribution
 - What are the emissions associated with agricultural-based burning?
 - Aerosols differ for different fuel types
 - Require better estimates of agricultural biomass burden.
 - Anticipating an increase in reliance on biofuels
 - What are the characteristics of the natural emissions from various biofuel plant stocks
 - What are the characteristics of the combustion emissions from various biofuel stocks (e.g., sugar cane vs. corn)
 - Need better characterization of natural biomass emissions

Direct Aerosol Forcing

- What are the microphysical and optical properties of mineral dust?
 - Can we define dust subtypes that would be useful in modeling?
 - How do optical properties change as dust ages?
- Marine aerosols
 - Require better understanding of the generation of and optical properties of marine types (sea salt, DMS, primary and secondary emission of organics)
- What is the role of “Twilight Zone” between aerosols and cloud on direct forcing?
- Semi-Direct Affect: recognized as important area, but no time to discuss

Emission Inventories

- Our understanding (incomplete) is that the accuracy of emission inventories is a matter of considerable concern. Is this a problem that ASP should address? If so, how?
- General consensus is that accurate Emission Inventories is critically important to DOE's climate research strategy. To our knowledge, maintaining and improving emission inventories is not the responsibility of any one agency in the US.
- Consensus was that updating and improving inventories was a problem too large for ASP. Need a national/international strategy for addressing this problem.
- Potential ASP contributions:
 - Suggestion was made to potentially explore collaborations with DOE's Carbon Cycle Research programs (Terrestrial Carbon Program & Free-Air Carbon Exchange) broaden to what these programs are doing to include measurements of natural emissions, biogenic emissions, and aerosol precursors.
 - Assessment (Validations) of inventories for a few metropolitan areas via highly targeted field missions.

Other Topics

(mentioned but no time to discuss)

- **Science questions/issues related to aerosol indirect effect and CCN**
 - How significant are new particles as sources of CCN?
 - What types of materials make good ice nuclei?
- **Science questions/issues related to aerosol-cloud interactions**
 - How do aerosol-cloud interactions change of the properties of aerosols?
 - How does vertical in-cloud transport affect aerosol properties/size distributions?
 - What is the role of cirrus particles in the processing of aerosols?
- **Science questions/issues related to SOA**
 - What are the organic sources SOA?
 - General consensus that much uncertainty still exists with respect to the growth rate of SOA number density.
- **Science questions/issues related to aerosol Lifecycle:**
 - Recognized as a major area of study for ASP. No time to discuss.